Alg. 2 Warm Up # 9-3

1. Find an equation for each sequence below. Then describe its graph.

a.

n	$t(n)$
3	8
5	2
7	−4

b.

n	$t(n)$
1	40
2	32
3	25.6

2. Factor completely:

a) $24x^3 + 52x^2 - 20x$

b) $18x^2 - 50$

HW Questions:

Preview

3-45. Rewrite each equation below. Then solve your new equation. Be sure to check your solution using the original equation.

a. $(n+4)+n(n+2)+n=0$

$n^2+2n+2n+4=0$

b. $\frac{4}{x}=(x+3)x$

$4=x^2+3x$

$0=x^2+3x-4$

$0=(x-1)(x+4)$

$x=1,-4$

3-46. Decide whether each of the following pairs of expressions or equations are equivalent. If they are, show how you can be sure. If they are not, justify your reasoning completely.

a. $(ab)^2$ and a^2b^2

b. $3x-4y=12$ and $y=\frac{3}{4}x-3$

c. $y=2(x-1)+3$ and $y=2x+1$

d. $(a+b)^2$ and a^2+b^2

e. $\frac{x^6}{x^2}$ and x^3

f. $y=3(x-5)+2$ and $y=2x-8$

3-47. Look back at the expressions in problem 3-46 that are not equivalent. Are there any values of the variables that would make them equal? Justify your reasoning.

$(a+b)(a+b) \stackrel{?}{=} a^2+b^2$

$a^2+ab+ab+b^2$

$a^2+2ab+b^2 \neq a^2+b^2$

for d

if $a=0$ and $b=1$

$(0+1)^2 \quad 0^2+(1)^2$

$1=1$

3-48. Find the formula for $t(n)$ for the arithmetic sequence in which $t(15)=10$ and $t(63)=106$.

n	15	63
$t(n)$	10	106

$t(n)=dn+a$

10 15

$m=d=\frac{106-10}{63-15}$

3-49. Jillian's parents bought a house for \$450,000, and the value of the house has been increasing steadily by 3% each year.

100% + 3% = 103% → Multiplier = 1.03

a. Find the formula $t(n)$ that represents the value of the house each year.

b. If Jillian's parents sell their house 10 years after they bought it, how much profit will they make? (That is, how much more are they selling it for than they bought it for?) Express your answer as both a dollar amount and a percent of the original purchase price.

450,000 —

a) $t(n) = 450{,}000(1.03)^n$

b) $t(10) = 450{,}000(1.03)^{10}$

3-50. Factor $5x^3y + 35x^2y + 50xy$ completely. Show every step and explain what you did.

$$5x^3y + 35x^2y + 50xy$$

$$5xy(x^2 + 7x + 10)$$

$$5xy(x + 2)(x + 5)$$

Reminder: Solving a Linear System

3 Methods

1) Substitution

2) Elimination

3) Equal Values

$x = 4 - 3(1)$

$x = 1$

$(1,1)$

$\begin{cases} x = 4 - 3y \\ 3x - y = 2 \end{cases}$

$3(4-3y) - y = 2$

$12 - 9y - y = 2$

$-10y = -10$

$y = 1$

$\begin{cases} 5x - 4y = 7 \\ 4(3x + y = 11) \end{cases}$

$12x + 4y = 44$

$5x - 4y = 7$

$17x =$

Yesterday's CP's: Purple

Share your ideas with your team. 5 minutes, then we'll check in before starting today's classwork.

$$\frac{x-3}{x} + \frac{2}{x-1} = \frac{5-x}{x}$$

$\sqrt{x^2-15x} = 10y$ $\sqrt{x^2-15x} = y+9$

$10y = y+9$

by equal values method

CP's: 3- #39 ---> 44

3-39. Graciela and Walter were working on solving the system of equations in part (f) of problem 3-38. They tried to rewrite both equations in $y=$ form so that they could set them equal to each other.

$$2y \cdot \frac{\sqrt{x^2-15x}}{2y} = 2y \cdot 5 \quad \Rightarrow \quad \sqrt{x^2-15x} = 10y \quad \Rightarrow \quad y = \frac{\sqrt{x^2-15x}}{10}$$

$$\frac{3\sqrt{x^2-15x}-3y}{3} = \frac{27}{3} \qquad \sqrt{x^2-15x} - y = 9 \qquad y = \sqrt{x^2-15x} - 9$$

Graciela and Walter realized they had a big mess to try to solve. "*Wait*," Graciela said. "*There's an easier way. Let's use substitution to make this system simpler!*"

a. Discuss this idea with your team. Does it make sense?

b. Walter and Graciela decided to try this new idea, but they were not sure the best choice for what expression to replace with a new variable. They came up with these two options:

$U = x^2 - 15x$ or $U = \sqrt{x^2-15x}$

To help Graciela and Walter decide, rewrite the original system from problem 3-38 part (f) twice, each time using a different version of U. Which version of U looks like it will make the system easier to solve?

c. Solve your new system for U and y.

d. Now what? Since your job in solving a system in x and y is to find values for both of those variables, you are not done. Work with your team to find a way to get the value of x from the value you found for U. Be ready to share your strategies with the class.

3-40. Consider each of the following equations and systems. Would substitution make them easier to solve? What expression might you temporarily replace with U? Be ready to share your ideas on substitution with the class. You do not need to actually solve the equation(s).

a. $(m^2+5m-24)^2-(m^2+5m-24)=6$

b. $2x+y^7=6$
$3x-2y^7=-5$

c. $(4x^2+4x-3)^2=(x^2-5x-6)^2$

3-41. MORE EQUIVALENT EQUATIONS

Rewrite each of the following equations in another form by solving for y. (That is, rewrite the equations in y = form.) Check to be sure your new equation is equivalent to the original equation.

a. $5x-2y=8$

b. $xy+3x=2$

3-42. Rewrite the equation from part (b) of problem 3-41 in yet another form by solving for x. Be ready to share your strategies with the class.

3-43. None of the three equations below are equivalent. Show that this is true by rewriting the equations with an equivalent equation.

$2x = 2y - 6$ $\qquad xy + 2x = (y + 2)(y + 3)$ $\qquad -x = -y - 3$

3-44. Angelica and D'Lee were working on finding roots of two quadratic equations: $y = (x-3)(x-5)$ and $y = 2(x-3)(x-5)$. Angelica made an interesting claim: *"Look,"* she said, *"When I solve each of them for $y = 0$, I get the same solutions. So these equations must be equivalent!"*

D'Lee is not so sure. *"How can they be equivalent if one of the equations has a factor of 2 that the other equation doesn't?"* she asked.

a. Who is correct? Is $y = (x-3)(x-5)$ equivalent to $y = 2(x-3)(x-5)$? How can you justify your ideas using tables and graphs?

b. Are the solutions of $0 = (x-3)(x-5)$ equivalent to the solutions of $0 = 2(x-3)(x-5)$? Again, how can you justify your ideas?

HW: 3-

51 ---> 56

Short quiz Thursday:

factor completely
(GCF and difference of squares)

simplify exponents